



# ALLOY 254 SMO SPECIFICATIONS: UNS S31254



## ALLOY 254 SMO (UNS S31254)

Penn Stainless inventory now includes Alloy 254 SMO (UNS S31254) in sheet, sheet coil, plate, round bar, processed flat bar and tubular products.

## GENERAL PROPERTIES

Alloy 254 SMO is a very high end, molybdenum and nitrogen alloyed super austenitic stainless steel with low carbon content. It demonstrates outstanding resistance to pitting, crevice corrosion stress cracking, and corrosion fatigue uniform corrosion. Alloy 254 SMO is substantially stronger than the common austenitic grades, with strength nearly twice that of 300 series stainless steel. It is also characterized by high ductility and impact strength. With high levels of chromium, molybdenum, and nitrogen, Alloy 254 SMO is frequently used in high chloride environments, such as brackish water, seawater, pulp mill bleach plants, and other chloride process streams. In some applications it has even been found to be a more cost effective substitute for high nickel and titanium alloys.

## APPLICATIONS

Due to its high levels of molybdenum and nickel, Alloy 254 SMO is frequently used in high chloride environments. Examples of applications that call for the used of Alloy 254 SMO include:

- Petroleum production
- Saltwater handling
- Pulp mill bleach systems
- Tall oil distillation columns
- Desalination equipment
- Food and chemical processing equipment
- Flue gas desulphurization scrubbers
- Offshore oil & gas production equipment

## STANDARDS ALLOY 254 SMO

ASTM/ASME .....UNS S31254  
EURONORM .....FeMi35Cr20Cu4Mo2  
DIN .....2.4660

ALLOY 254 SMO (UNS S31254) CAN BE PROCESSED BY PENN STAINLESS UTILIZING THE FOLLOWING METHODS:

- SHEAR CUTTING
- PLASMA CUTTING
- HQ PLASMA CUTTING
- DYNAMIC WATER JET CUTTING
- LASER CUTTING
- SAW CUTTING
- GAUER PROCESSING
- MACHINE CUTTING



## PRODUCT OFFERING:

- SHEET
- PLATE
- PERFORATED
- ROLLED FLAT BAR
- S/E PROCESSED BAR
- TUBULAR PRODUCTS

## CORROSION RESISTANCE

- Excellent resistance to pitting and crevice corrosion due to its high chromium, molybdenum, and nitrogen content
- Has a very low carbon content, which means there is very little risk of carbide precipitation during heating
- Possesses very good resistance in water containing chlorides, therefore, it is suitable for use in seawater as it can be exposed to it for prolonged periods without suffering from crevice corrosion

## WELDABILITY

- Possesses good weldability
- Should be done without pre-heating
- If correctly performed, there will be no need for any subsequent heat treatment
- Has low thermal conductivity and high thermal expansion so must minimize distortion of welded joint
- Welding without filler metal results in poor strength properties

## MACHINABILITY

- High work hardening rate combined with a lack of sulfur makes it very difficult to machine
- Slow speeds, sharp tools, positive feeds, over-powered machine tools, and ample lubrication offer the best results

## CHEMICAL PROPERTIES

Type	C	Cr	Cu	Mn	Mo	N	Ni	P	Si	S
254 SMO	0.02 max	min: 19.5 max: 20.00	min: 0.5 max: 1.00	1.00 max	min: 6.0 max: 6.5	min: 0.18 max: 0.20	min: 17.5 max: 18.0	0.03 max	0.80 max	1.01 max

## MECHANICAL PROPERTIES

Grade	Tensile Strength ksi (MPa) min	Yield Strength 0.2% offset ksi (MPa) min	Elongation (% in 50mm) min	Hardness (Brinell) MAX	Hardness (Rockwell B) MAX
254 SMO Sheet & Strip	100 (690)	45 (310)	35	223	96
254 SMO Plate	95 (655)	45 (310)	35	223	96

## PHYSICAL PROPERTIES

Typical Values	
Density	8.0 kg/dm <sup>3</sup>
Modulus of Elasticity	195 GPa
Linear Expansion at 68 to 212°F (20 to 100°C)	16.5 X10 <sup>-6</sup> /°C
Thermal Conductivity	14 w/m°C
Thermal Capacity	500 J/kg°C
Electrical Resistivity	0.85 μΩm